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Grace blasts into orbit

By Alan Buis



The Gravity Recovery and Climate Experiment (Grace) launches from the Cosmodrome at Plesetsk, Russia on Sunday, March 17.



Following a delay of 24 hours due to high winds, the JPL-managed Gravity Recovery and Climate Experiment

(Grace) was successfully launched from the Cosmodrome at Plesetsk, Russia on Sunday, March 17 at 1:21:27 a.m. Pacific time.

Under partly cloudy, cold skies, the twin Grace satellites lifted off on a Russian Rockot launch vehicle. Riding nearly 160,000 kilograms (approximately 350,000 pounds) of thrust, the rocket headed northward over the Arctic Ocean and Alaska, then south across the Pacific Ocean and Antarctica before heading north again over Africa and Europe. At 85 minutes, 38 seconds into the mission—or 2:47 a.m. Pacific time—the satellites separated from the launch vehicle's third stage above Africa into a polar orbit 500 kilometers (311 miles) above Earth. Ground controllers successfully acquired the spacecraft's signal from the German Space Operations Center's ground tracking station in Weilheim, Germany at 2:49 a.m. Pacific time. Initial telemetry reports received by the Grace team showed both satellites to be in excellent health.

Following separation, the leading GRACE satellite began pulling away from the trailing satellite at a relative speed of about 0.5 meters (1.6 feet) per second. Over the course of the next few days, the satellites will be spaced 220 kilometers (137 miles) apart—a little more than the distance between Los Angeles and San Diego. Grace will precisely measure Earth's shifting water masses and map their effects on Earth's gravity field. The five-year mission is the first launch of NASA's Earth System Science Pathfinder program. As they race around the globe 16 times a day, the satellites will sense tiny variations in Earth's surface mass below and corresponding variations in Earth's gravitational pull. Regions of slightly stronger

gravity will affect the lead satellite first, pulling it slightly away from the trailing satellite. By measuring the constantly changing distance between the two satellites using an extremely sensitive microwave ranging system and combining that data with precise positioning measurements from Global Positioning System instruments, scientists will be able to construct a precise Earth gravity map. Through the first week of April, basic satellite operations will be established. During a subsequent three-week commissioning phase, Grace's science instruments and supporting systems will be powered up, evaluated and calibrated. The performance of the Grace system for measuring Earth gravity will then be validated over the following six months. The mission then enters its observational phase, during which routine operational data products will be made available to scientists. Grace will be a scientific boon to researchers who study Earth with space-based instruments. The monthly gravity maps generated by Grace will be up to 1,000 times more accurate than those currently in use, substantially improving the accuracy of many techniques used by oceanographers, hydrologists, glaciologists, geologists and other scientists to study phenomena that influence climate. These phenomena range from shallow and deep ocean currents, water movement on and beneath Earth's surface, and the movement and changing mass of ice sheets, to sea-level heights, sea-level rise and changes in the structure of the solid Earth. Additional information about the Grace program is available on the Internet at <http://www.csr.utexas.edu/grace>. Grace is a joint partnership between NASA and the German Center for Air and Space Flight. JPL manages the U.S. portion of the project for NASA's Office of Earth Science. Science data processing, distribution, archiving and product verification are managed under a cooperative arrangement between JPL and the University of Texas' Austin-based Center for Space Research in the United States and Germany's Earth Research Center.

Lab event helps the blind touch the stars

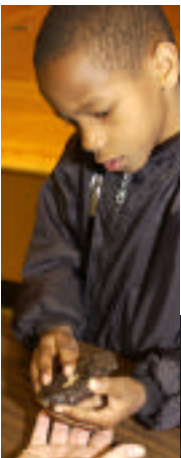
By Mark Whalen



Students from Annalee School enjoyed feeling tactile maps and meteorites during their visit to von Kármán Auditorium. At right, JPL astronomer Steve Edberg helps a student feel the Voyager model.

Blind adults, blind school children and teachers of blind students touched the stars and toured the planets in a recent JPL event designed to share the wonders of astronomy. Students and teachers from Annalee Elementary School in Carson, along with some parents, visited the Lab March 18, a day after the event was canceled at Mount Wilson Observatory due to snowy conditions. One of the highlights of the visit was a scale-model solar system stretching across von Kármán Auditorium, which allowed participants to learn the relative distances of the planets from the sun. JPL astronomer and Cassini investigation scientist Steve Edberg moved slowly from one planet in the display to the next as the students followed the sound of his voice. Edberg also helped the kids feel the Voyager spacecraft model in von Kármán, explaining the infrared camera and telescope, and talked about meteorites as the kids held samples from California and Arizona desert. Edberg, who teaches an astronomy class at La Cañada High School, appreciated the students' interest in science. "This group of kids was just like those in all the classrooms I've visited," he said. "They are interested in space and the universe and all the gee-whiz stuff they hear about, like black holes. This group also asked questions about robotic space exploration, including some tough what-if questions. When they were asking questions their im-

paired sight made no difference at all. "Helping people expand their knowledge and understanding, especially of something that already interests them, is always enjoyable," Edberg said. "I learned a lot too, and got to create new ways to share information and experiences with a group that doesn't usually receive attention in our field. Figuring out ways to share knowledge learned with a sense that the audience doesn't get to use challenges my creativity." Dr. David Hurd, planetarium director and astronomy professor at Edinboro University in Pennsylvania, provided Braille tactile maps for participants to feel the stars, planets and constellations, showing the familiar shapes from the night sky. "It's fun," said Norma, 8. "I liked feeling the moon." Hurd taught visitors a jingle to help them remember the initials of the planets from the sun out: "My very educated mother just served us nine



Photos by Dutch Slager / JPL Photolab

News Briefs



The new history of the Deep Space Network.

Next ISO audit set for April 1–3

It has been three years since JPL was awarded ISO certification from Det Norske Veritas (DNV), an external auditing company. Last year, NASA re-competed the ISO registrar contract and awarded it to National Quality Assurance, USA, who will replace DNV as JPL's external auditor for the next three years.

From April 1-3, two National Quality Assurance auditors will conduct their first ISO audit at JPL. This audit will be similar to previous surveillance audits that were held every six months. The audit will look at various aspects of configuration management, mission operations and task order review, as well as closure of the corrective actions issued from the last ISO audit conducted by DNV.

The audit schedule (which is subject to change) is available on the ISO website at <http://iso.jpl.nasa.gov>. See your ISO organization representative (listed at <http://iso/help/list-orgreps.html>) for details about how the audit will affect your organization.

New book profiles history of DSN

"Uplink-Downlink: A History of the Deep Space Network 1957-1997" has just been published by the NASA History Office. Authored by DOUGLAS MUDGWAY, a retired JPL engineer involved in the development and operation of the DSN for 30 years, the book is dedicated to the memory of DSN pioneer DR. NICHOLAS RENZETTI, with a foreword by former JPL Director DR. WILLIAM PICKERING.

The book is available to view in the JPL Library, or copies may be purchased online from the Government Printing Office at <http://bookstore.gpo.gov> or order by phone at (866) 512-

1800 or (213) 239-9844. The reference number for the book is SP-2001-4227.

Contracts class starts April 4

The third in a series of eight UCLA Extension classes on government contract and proposal management at JPL will be held in the 190 cafeteria from 5 to 8 p.m. on Thursdays beginning April 4 and continuing through June 20. To enroll, attend on the first night and pay the \$380 fee with a check or credit card. Tuition reimbursement is available for almost the full cost of the class through JPL Education and Training Providers (<http://hr/et/>), and special education loans are available to Caltech Credit Union members.

Students come from many different directorates at JPL and find the class a useful opportunity to learn from each other as well as improve their career mobility and visibility. Repetition of the first two classes will depend on interest at JPL after completion of the eight scheduled classes. Students who successfully complete all eight classes will receive a certificate of completion for the UCLA Extension/JPL Government Contract and Proposal Management Program.

JPL at Cherry Blossom Festival

JPL's Asian American Council will staff three booths at the April 5-7 Cherry Blossom Festival, to be held at the Pasadena Convention Center. The council is seeking volunteers to help staff a booth featuring a Mars display and rover, and two booths for the festival's "Kids' Corner."

For information on volunteering, call REGGIE SAKURAI, ext. 4-4883. For information about the festival, visit <http://www.jpdizon.com/sites/cherry>.

Special Events Calendar

Ongoing Support Groups

Alcoholics Anonymous—Meetings are available. Call the Employee Assistance Program at ext. 4-3680 for time and location.

Codependents Anonymous—Meeting at noon every Wednesday. Call Occupational Health Services at ext. 4-3319.

Gay, Lesbian and Bisexual Group—Meets the first and third Fridays of the month at noon in Building 111-117. Call the Employee Assistance Program at ext. 4-3680 or Randy Herrera at ext. 3-0664.

Caregivers Support Group—Meets the first Thursday of the month at noon in Building 167-111 (The Wellness Place). For more information, call the Employee Assistance Program at ext. 4-3680.

Working Parents Support Group—Meets the third Thursday of the month at noon in Building 167-111 (The Wellness Place). For more information, call the Employee Assistance Program at ext. 4-3680.

Monday, April 1

Cesar Chavez Celebration—Eric Reyes Chavez, eldest grandson of labor leader Cesar Chavez, will speak at an event hosted by JPL's Amigos Unidos. The event will be held in von Karman Auditorium from 11:30 a.m. to 1 p.m. For more information, visit the Amigos Unidos website at <http://eis/au>.

Tuesday, April 2

JPL Gamers Club—Meeting at noon in Building 301-227.

JPL Genealogy Club—Meeting at noon in Building 301-271.

Wednesday, April 3

Associated Retirees of JPL/Caltech—Meeting at 10 a.m. at the Caltech Credit Union, 528 Foothill Blvd., La Cañada.

"Planets Orbiting Nearby Suns"—Caltech postdoctoral astronomy fellow Dr. David Charbonneau will speak at 8 p.m. in Caltech's Beckman Auditorium. Admission is free. For information, call (626) 395-4652.

Thursday, April 4

JPL Gun Club—Meeting at noon in Building 183-328.

Saturday, April 6

Second Hand—The post-modern performance dance ensemble will perform at 8 p.m. in Caltech's Beckman Auditorium. Tickets are \$22,

\$18 and \$14; youth high school age and under \$10. For information, call (626) 395-4652.

Sat., April 6–Sun., April 7

All-Mozart Concert—The Caltech Chamber Singers will give a free concert at 8 p.m. Saturday and 3:30 p.m. Sunday in Beckman Auditorium. Call (626) 395-4652.

Sunday, April 7

Chamber Music—Works by Minimum Security Composers Collective, kellogg, Kernis Rzewski and Coleman will be presented in a 3:30 p.m. concert in Caltech's Beckman Auditorium. Tickets are \$27, \$23, \$19 and \$15. Call (626) 395-4652.

Tuesday, April 9

JPL Stamp Club—Meeting at noon in Building 183-328.

Wednesday, April 10

JPL Amateur Radio Club—Meeting at noon in Building 238-543.

JPL Toastmasters Club—Meeting at 5 p.m. in the 167 conference room. Guests welcome. Call Joy Hodges at ext. 4-7041 for information.

Thursday, April 11

CMA Excellence in Management Award—The Caltech Management Association will honor Caltech trustee and Northrop Grumman Chairman and Chief Executive Officer Kent Kresa. The award recognizes an executive for demonstrating extraordinary vision and leadership. The event will be held at the Athenaeum, with reception at 6 p.m., dinner at 7 and program at 8:15. Cost: \$45 for CMA members, \$50 for members' guests and \$55 for non-members, which includes CMA membership. Reservation deadline is April 8. For more information, call Alice Tangney at ext. 4-7702.

Friday, April 12

"Royal England"—This travel film will be presented at 8 p.m. in Caltech's Beckman Auditorium. Tickets are \$9 and \$7. For information, call (626) 395-4652.

Saturday, April 13

Ethos Percussion Group—Featured on this 8 p.m. program in Caltech's Beckman Auditorium will be the Missa Luba Congolese mass, performed with the Kirk Choir of the Pasadena Presbyterian Church and tenor Leslie Thomas. Tickets are \$22, \$18 and \$14; youth high school age and under \$10. For information, call (626) 395-4652.

Six JPLers win SFA honors



Above, left to right: Mits Iwanaga, Genny Lopez, Amy Ryan, Leslie Lamb, Kirk Barrow, Joanne Shimada, guest Jim Erickson.

Six JPL employees earlier this month received NASA's Space Flight Awareness award. The sextet traveled to Kennedy Space Center to see the March 1 launch of Space Shuttle Columbia, the Hubble Space Telescope repair mission that marked Columbia's first flight in more than two years following its refurbishment.

Honorees Kirk Barrow (Section 531), Mitoji Iwanaga (204), Leslie Lamb (344), Genny Lopez (256) Amy Ryan (346) and Joanne Shimada (334) also received a VIP tour of Kennedy Space Center as part of the award.

At JPL, the Space Flight Awareness Program is administered by the Employee Services and Recognition Group. For more information, visit <http://eis/sec614/reward/#sfa>.

Four receive Lew Allen Award

From left: Senior Research Scientist Dr. Moustafa Chahine, Dr. Ayanna Howard, Dr. Juergen Mueller, Dr. Ian Joughin, Dr. Victoria S. Meadows, JPL Director Dr. Charles Elachi.

Four JPL Scientists have received the 2001 Lew Allen Award for Excellence.

The annual awards recognize and encourage significant individual accomplishments or leadership in scientific research or technological innovation by JPL employees during the early years of their professional careers.

The recipients are Dr. Ayanna Howard of the Autonomy and Control Section 3454, Dr. Ian Joughin of the Radar Science and Engineering Section 3340, Dr. Victoria S. Meadows of the Earth and Planetary Atmospheres Section 3233 and Dr. Juergen Mueller of the Thermal and Propulsion Engineering Section 3534.

Howard received her award for contributions to autonomous systems development, including innovative real time software tools for spacecraft precise and safe entry descending and landing applications.

Joughin was recognized for pioneering research in use of interferometric synthetic aperture radar for polar ice sheet topography and motion; development of remote sensing techniques for vector measurement of ice flow and contributions to Earth



Science missions.

Meadows was recognized for initiative and leadership in bringing to JPL an important new research endeavor in the now-evolving area of detection of biosignatures from extrasolar planets by spectroscopic observations with space-based astronomical instruments.

Mueller received his award for groundbreaking work in development of miniaturized thrusters and feed system components, a new area of propulsion engineering, which is critical

to the development of highly capable micro-spacecraft.

Each winner received a wall plaque and a grant of \$25,000 from the Director's Research and Development Fund, which is used at JPL to enhance the professional efforts of the awardees.

The award was established in 1990 in honor of Dr. Lew Allen, who served as JPL's director from 1982–90.

Former ERC store undergoes transformation for its reopening next week

A couple of months ago, Caltech Auxiliary and Business Services took over the operation of JPL's store (formerly a part of the Employee Recreation Club or ERC). [JPL's Human Resources Office is responsible for subclubs as well as employee events and activities.] Tom Mannion, director of Caltech Auxiliary and Business Services, discusses the state of the store's remodeling, plans for next week's grand opening, and prospects for future services.

By Mark Whalen

How did your group at campus get involved with managing the JPL Store?

Over the past several years we've worked to make our bookstore uniquely Caltech: to meet the specific needs of the faculty, students and staff, and to have a high-quality store. We're looking to implement a similar model for the Lab: a store that provides the services to support JPL's mission, the staff and visitors as well—a store that is uniquely JPL.

Our group also provides dining and vending services at JPL, and now we're getting a better picture of the needs of everyone on Lab. The opportunity to include JPL as a part of our larger community was a natural.

Having the JPL Store as part of our operation should benefit us with the ability to get better prices from distributors on apparel and other merchandise as we buy larger quantities.

Will the new store offer all new services and merchandise?

We looked at what the previous store offered, and we plan to offer even more merchandise.

The sale of tickets to sports and entertainment events will certainly be continued, and we'll see what we can do to expand it and make it better. Photo developing and associated products such as film will continue to be sold. And we will have a large number of scientific exploration-based toys.

We hope to put in some basic convenience items; for example, people can buy a small quantity of Tylenol without getting in their car and losing their parking space.

We're also trying to build a better environment near the store. We have a new food and coffee cart right outside the door, which offers hot and cold drinks, pastries, salads and sandwiches.

In general, we're playing it by ear and will be responsive to what our customers need.

How have you gone about the process of reorganizing the store?

We heard some good suggestions from people here. And some things were obvious to me when I walked in—it was somewhat dark, there was no room for people if there's a long line, you can't see things up close before you buy them. Eventually we'd like to break out the front counter to create a store where people can really interact with the merchandise.

People have been used to going to the old store thinking, "I have to know what I want, tell them and they'll get

it for me." We'd really like to make it a store in which, for example, you can go in and watch part of a DVD or video, browse through the pages of a book, or feel the elasticity of a sweatshirt or the durability of a toy. Thus far, we've only been able to take out the front wall, which JPL went out of their way to do. Customers won't be able to browse through the store yet, but that is our long-term goal.

For the opening week, we will place more merchandise in front of the counter in display racks. The new mail service will be available, and there'll be some new books there. We will also be on line on April 1. The site will be hosted at campus.

What activities are planned for the grand opening during the week of April 1?

The store will be open its normal hours, 9 a.m. to 4 p.m., Monday through Friday. The festivities will include live music on Monday and Friday, noon to 1 p.m. Refreshments will be served Monday and Friday, 11 a.m. to 2 p.m.

A barbeque lunch will be made available for \$4.95 per plate, Tuesday through Thursday, 11 a.m. to 2 p.m. There will be raffles every day. The raffle giveaway will include pens, movie tickets, coffee rover mugs, postal collectibles, complimentary FedEx mailings or JPL insignia clothing.

One thing that will be available on April 1 will be tickets for JPL/Caltech day at Dodger Stadium, for the June 1 Arizona Diamondbacks game. More than 3,000 right-field pavilion tickets will be set aside for JPL and campus employees. There will be carnival-like activities for kids before the game, and tickets will be \$10. Bus transportation will be available as well.

We'll also start marketing a private party at Magic Mountain May 10, where JPL, campus and perhaps another company will have exclusive use of the park in the evening. Tickets will be \$20, including parking.

How will the new mail service work?

This area will be to the left as you enter the store. There will be a package-supply stand with boxes, labels, etc., and a scale to weigh packages. We'll offer the U.S. Postal Service as well as Federal Express. Packages will be collected at the Lab, then taken to the campus for processing. All FedEx services—including Saturday morning, two-day delivery, etc.—will be available.

We'll also sell stamps over the counter. The stamp machine in the vending area next door will remain, though, as that service is helpful to those who are here after hours.



Photos by Bob Brown / JPL Photolab

We will eventually expand the service to offer gift wrapping, particularly during holiday season.

The green mailboxes around the Lab will remain for Postal Service letters and small packages.

What challenges do you face?

Being where we are, accessibility to the community and visitors is sometimes a bit difficult. Long term, we are looking at the possibility of moving part of the operation closer to the visitors' center at the main gate. There's some interest in doing this and some good discussions have taken place. We'll benchmark some other NASA facilities for ideas.

How can people at JPL contact you with comments or questions?

My phone number on campus is (626) 395-6174 (from on Lab, dial 161 and 6174). My e-mail address is Mannion@its.caltech.edu.

Tom Mannion, director of
Caltech Auxiliary and
Business Services

Service awards

DailyPlanet

news for the JPL community

Classified ads will be available the day before Universe is published, at <http://dailyplanet>

JPL's online news source

View this and previous issues of Universe online <http://universe.jpl.nasa.gov>

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Notice to Advertisers

Advertising is available for JPL and Caltech employees, contractors and retirees and their families. No more than two ads of up to 60 words each will be published for each advertiser . Items may be combined within one submission. Ads must be submitted on ad car ds, available at the ERC and the Universe office, Bldg. 186-118 , or via e-mail to universe@jpl.nasa.gov . Ads are due at 2 p.m. on the Monday after publication for the following issue.

All housing and vehicle advertisements require that the qualifying person(s) placing the ad be listed as an owner on the ownership documents.

The following JPL 2002 first quarter service award recipients celebrating 20 or more years of service attended a luncheon in their honor March 14:

40 years: Edward Greenberg, Stephen Gunter, Donald Lord, Arvydas Vaisnys, Ray Wall, Albert Whittlesey, C.A. Yamarone Jr.

35 years: Elsa Abbott, Robert Chandler, Julie Corpe, John Houseman, Charles Leising, Gary Milam, Edward Ng, Ronald Ploszaj, Phil Salomon, Gael Squibb, Shirley Stroup, Richard Williamson.

30 years: Sandra Dewegeli, Earl Higa, Robert Jacobson, Bonnie Kun- kle, John Martonchik, James Weiss.

25 years: John Armstrong, Henry Awaya, Gary Bruner, Stuart Dejesus,



Robert Ferber, Greg Goodson, Yvonne James-Bivins, Joseph Kahr, R. Lloyd Keith, Charles Lahmeyer, Yolanda Oliver, Mary Reaves, Ronald Salazar, Jeffrey L. Smith, Linda Spilker, Glenn Veeder Jr.

20 years: Rose Ackerley, Ronald Alley, Clark

Burgess, Lisa Campbell, Jennifer Cruz, Sherrill Eastman, Larry Edmonds, Daniel Finnerty, Larry Fowler, Page Garcia, Ann Hall, Faiza Lansing, Steve Monacos, Michael O'Connell, Benjamin Saldua, Cesar Sepulveda, Choon-Foo Shih, Thomas Thompson, John Tullius.

For information on JPL's Employee Services & Recognition Program, log on to <http://eis/sec614/reward>.

Passings

ODELL RAPER, 72, retired manag- er of the Offices of Science Adminis- tration, Elements 3211 and 3214, died of cancer Nov. 19 at his home in Tujunga.

Raper joined the Lab in 1959 and retired in August 2001. He is survived by his wife, Nancy, three sons, two daughters and five grandchildren. Services were private.

WILLIAM LINNENKOHL, 94, a retired technical manager from Section 647, died of cardiac arrest March 1.

Linnenkohl worked at JPL from 1965–76. He is survived by his wife, Esther, daughter Betty True, two grandsons and four great grand- daughters.

Burial was at Eternal Valley in Newhall.

DENNIS MACIEJ, 61, a senior engineer in Section 357, died of cancer March 2 at his home in Lan- caster.

Maciej had worked at JPL since 1976.

He is survived by his wife, Kathleen Tharp-Maciej, three children and four grandchildren. Services were private.

DR. THOMAS WYNNE, 83, retired JPL staff physician, died of pneumo- nia March 13.

Wynne served as staff physi- cian at the Lab from 1954 to 1979. He is survived by his wife, Arline, sons Thomas Jr. and James, daughters Catherine and Mar- garet, and five grandchildren. Services were held March 19 at Mater Dolorosa Retreat Center in Sierra Madre. In lieu of flowers, the family requests donations be made to Flying Samaritans International, 3444 Parkside Dr., San Bernardino, CA 92404.



Dr. Thomas Wynne

Letters

Thank you to my Contract Manage- ment Office co-workers for the comfort- ing words and beautiful plants in the passing of my mother in Hawaii. Your support then and now has meant more than words can express. Thank you also to the ERC for the thoughtful plant.

Joyce N. Grunwald

I would like to thank my many friends at JPL for their kind thoughts and words following the recent death of my mother in Vermont. Her illness came on very suddenly and unexpectedly. I also wish to thank ERC for the lovely plant we received at home.

Phil Moynihan

I would like to express my apprecia- tion for the beautiful plant sent in honor of my husband, retiree William Swanson.

Helen Swanson

Classifieds

For Sale

BED, twin matr. & ash wood frame w/2 drawers, \$150; DESK, child's (44" x 18" x 30"), & chair, ash wood, \$75, all in exc. cond. 790-6136. BED, hardly-used queen-size from hardly-used guest bedroom; purchased new in Sept. 2001; Sealy Posturpedic Premier mattress and box spring set; \$250. 695-0811, Bob. BICYCLES, kid's: 24" Raleigh Mountain Scout, \$100; 20" Novara Dirt Rider, \$100; quality bikes in exc. cond., not toy store junk; pictures at <http://home1.gte.net/res000mx/bikes.html>. 626/358-0778, steven.jenkins@eee.org. CAMERA: Digital Olympus D600L. 1.4 Megapixels; through-the-lens viewfinder, extra memory card; bonus accys: Olympus battery charger w/ NIMH batts; camera case; exc. cond., great for Web pictures. \$140. 957-2773. COMPUTER, Macintosh Quadra 850, monitor, keyboard, mouse, modem, \$100. 248-9418. COMPUTER HUTCH: wood grain appearance, pull-out keyboard tray, shelves for printer & CPU & other cubby-like shelves, on wheels, 61" H x 32.5" W x 19.5" D, \$50/obo. 626/798-0329. DARKROOM EQUIPMENT, Durst M300 enlarger for 35 mm, polycontrast filters, enlarger timer, developing tanks, safelights, trays, print dryer and other incidentals, \$100. 626/584-6518. DRESSES: evening/prom, 2 new designer, one by ABS, size 12, price tag \$329, sell \$200; one by Sache, size 10, price tag \$268, sell \$165. 241-8208, eve, Irena. DRYER, 8 years old, Fridgidaire, gas, minimally used, \$50. 562/693-2986. ENTERTAINMENT CENTER, holds 27" TV, shelf for VCR, 3 additional shelves, 3 drawers + cab- inet w/2 shelves, vg cond., \$50. 362-7750. EXERCISE EQUIPMENT from PowerTrainer, bench arrangement, comes w/how-to-use VHS video, rarely used, \$50. 362-7750. FLY ROD, four section, 7.5 ft., with case, made by Southbend, vg cond., \$40. 626/793-1895. FOLDING CHAIRS, 4, card-table type, vg cond., \$32; BEACH CHAIRS, 2, exc. cond., \$12 value, \$6/ea. 626/793-1895. GOLF CLUBS, Nicklaus Golden Bear, graphite, \$175. 626/339-6498. LOVESEAT, like new, overstuffed, hunter green/brown/tan abstract pattern, \$185 obo. 626/254-1550. MOUNTAIN BIKE, Trek 18" frame, black, exc. cond., only ridden a few times, sacrifice at \$200/obo; BIKE RACK for car \$25, never used. 323/255-8635. MOVING SALE, Danish hide-a-desk cabinet, \$250; twin motorized adjustable sick bed, \$350; double mattress, springs and frame, \$50. 952-8468. PLAYER PIANO: Schafer & Sons, cherry wood, model # PS48, retail \$7,695, exc. cond., w/bench & rolls, \$2,000/obo. 805/987-5766. REFRIGERATORS, G.E., 1 is beige, 17 yrs. old, side by side, \$100, other white, 15 yrs. old, top freezer, \$100; TABLE, din. rm, w/leaf, cherry- wood tops, black legs, 4 chairs, gd cond, \$150; SOFA/SLEEPER, makes into queen-sz. bed, ab- stract black, blue & mauve, gd cond., \$300; BIKES (4), children's, \$15/ea. 626/357-8210. REFRIGERATOR, full size, Hotpoint, used only 2 years. \$150. 626/398-3649, Jennifer. ROLLER SKATES, in-line K2 Extreme Flight, almost new; all receipts, paperwork and tool; size 10.5; knee, elbow, and wrist guards included; \$150. 640-7479, Greg. SKI BOOTS, Nordica, men's size 12, exc. cond., \$50. 626/793-7879. SOFA BED, 70", like new, charcoal brown, \$125; WAGON, Radio Flyer, \$15; PUSH LAWN MOWER, \$40; BUFFET TABLE, folding, on wheels, removable glass tray on top, like new, \$30. 248-4647. TOASTER OVEN, extra-lg. capacity (bakes 10" cakes/5 lb. chicken/2.5 qt. casserole); DeLonghi Alfredo DeLux; 10 yrs old, but brand new (box never opened); \$70. 892-2674, Bridget, kriketbml@juno.com (note: character before the @ is a lower case L, not a numeral 1). TOY COLLECTION, Star Trek, huge; all in mint, unopened cond.; pricing for indiv. items but prefer to sell collection as a whole, will deal on pricing for complete collection; un-priced items open for offers; http://briefcase.yahoo.com/john_de_pablos then stlist.xls for details and prices. 777-9671 or john_de_pablos@hotmail.com. TRADING CARDS, basketball, 179 assorted, from early to mid 1990s, \$6. 626/332-2682. VACUUM CLEANER, Shop Vac, rigid, 12 gallon, orig. \$69, never used, \$50. 626/793-7879. VIDEOAPE, Disney's "Aladdin & the King of Thieves," VHS, new, sealed, \$17; other brand- new Disney videos also avail. 562/420-2313. WASHER (like new) & DRYER (gas), \$250; STUDENT DESK, \$25; OFFICE DESK, \$45. 248-9418.

Vehicles/Accessories

'94 CHEVROLET Camaro, V6, Bose spkrs, CD, T-top, teal, pwr. windows/driver's seat, 115K mi., \$7,000. 362-1159.

'96 DODGE Neon, blue, 2 dr, 5 speed, AM/FM cass., CD w/multi changer and remote, 133K mi., \$1,200 obo. 909/596-8117. '84 DODGE D-50 pickup truck, vg cond, 2.6L eng., auto trans, bedliner, shell, very clean; new tires, radiator, carburetor, and battery; all receipts on request, 141K, orig. owner, \$2,200. 626/332-2682. '97 FORD Taurus GL sedan, 84K fwy. mi., V6 automatic, 4-door, a/c, pwr. steering/ABS brakes/window/doorlocks, dual air bags, cruise control, metallic silver, immaculate, Michelin tires, \$4,995. 626/798-1765. '89 FORD Aerostar XL van, red w/gray interior, well maintained, exc. cond., 122K mi., located in Ontario, \$2,000. 909/988-8199. '94 HONDA Civic, 102K mi., 1 owner, 2 dr., ABS, moonroof, elect. windows, am/fm/cass., cruise cont., a/c, white exterior with gray inter- ior, Blue book \$5,000, sell \$4,000. 893-3108. '93 HONDA Accord LX, 5 speed, 4 dr., 89K miles, orig. owner, a/c, am/fm/cassette, vg cond., \$6,000/obo. 249-4602. '81 HONDA Interstate SilverWing, shaft drive, water cooled, Prolink suspension, just over 6,000 miles, garage kept, near mint, includes second seat for passenger; see <http://home.at-tbi.com/~macmaven/sw/index.htm> for pictures; \$2,250. 353-2103. '84 NISSAN 300Z, 2-dr. coupe, blue, 150K mi., 1 owner, fair cond., \$900. 626/355-9723, Neil. '00 TOYOTA Corolla VE, automatic, 4 door, a/c, am/fm cass. stereo, tinted glass 37K, exc. cond. \$9,950. 626/798-6488. '97 TOYOTA Camry LE, 57,600 mi., white w/ gold trim, alloy wheels, moon roof, pwr. locks/ windows, great cond., \$11,500. 626/290-1970. '95 TOYOTA Corolla DX sedan, 4 dr., pearl green ext., gray int., gd. cond., 85K mi., a/c, am/fm/cass., dependable, \$5,300/obo. 909/ 949-2133. '94 TOYOTA Tercel DX sedan, 4 dr., 110K mi., a/c, auto, am/fm radio, good cond., \$3,400, serious buyers only. 626/445-3808 or euihyeok@netzero.net. '93 TOYOTA Tercel, 2 dr, with 37,000 only, a/c, 4-speed manual, exc. cond., w/airbags, \$3,000/ obo. 626/794-4921 or 323/393-2831, Bert. '98 VW Jetta GLS, 40K mi., moon roof, new tires, full service records, exc. cond., \$10,999/obo. 626/695-2075, John. '74 VW Super Beetle, yellow, gd. cond, fully operable and presentable, \$3,400/obo. 626/395-6418.

Free

DOG DOOR PANEL, fits into sliding door, silver color, flap measures 7" x 11" (medium size), bought at Home Depot for \$100 three years ago, our mutt grew too big. 249-4683. SPA/HOT TUB: Freestanding unit, working order, we're upgrading: inside fiberglass, outside natural wood siding; includes cover, 120V electr. incl. heat; receiver must provide trans- port (pickup truck OK). 626/794-7343.

Wanted

APARTMENT in Glendale area, 2 bd., starting ASAP; 2 adults (sisters), 2 children (boys), no pets; prefer quiet, safe neighborhood. 805/443-7264, Charlie or Chad. CAMPER SHELL, black, for 1997 Ford Ranger short-bed truck. 626/488-8616. SPACE INFORMATION/memorabilia from U.S. & other countries, past & present. 790-8523, Marc Rayman. THAI TEACHER, spoken language, for future vacation to Thailand, poss. 2 students. 626/584-4415. VOLLYBALL PLAYERS, coed, no beginners please, Tues. nights 8 to 10:00 at Eagle Rock High School, \$3/nt. 956-1744, Barbara.

Lost & Found

Found: READING GLASSESin Bldg. 180-101 on March 12. Ext. 4-3406, Donna. Found: SUNGLASSES,Esprit, in East lot on March 25. Ext. 3-5323, Don Eagles

For Rent

ALTADENA, charming house, 2 bd., 2 ba., near Christmas Tree Lane; hardwood floors, fireplace, appliances, fenced back yard, fruit trees, roses; includes water, gardener, trash; see www.alumni.caltech.edu/~chrisc; \$1,650. 626/794-9579. ALTADENA, furn. rm. in priv. residence, 5-10 min. bike ride to JPL, tennis & basketball nearby, laundry, kitchen, shared bath, \$400. 626/798-2523. BURBANK HILLS, 4 bd., 1 3/4 ba., above Glenoaks, gardener, complete new int., close to schools, huge yd, 15 min./JPL, \$2,600. 843-7180. CLAREMONT-area townhouse, 3 bd., 2 1/2 ba., patio, pool, spa, beautiful neighborhood, \$1,400. 909/593-1239, Joann.

COVINA, two rooms, \$350/ea. 626/339-6498. GLENDALE, furn. rm, cent. courtyard with run- ning fountain, deck w/gazebo, bathroom w/garden view, complete house privileges, util./cable paid, no smoking/drinking, \$625. 246-4750. TUJUNGA, furnished room in 3-bd., 1-ba. home w/pool, washer/dryer, all utilities paid, kitchen privileges, no pets, \$500. 353-1734. PASADENA house for lease, near Caltech, avail. May 1, 3 bd., 2 ba., living room, nice kitchen, fenced yard, 2-car garage, no pets, no smoking, gardener included, \$1,300 + \$1,300 security deposit. 626/794-0455. PASADENA, spacious 2-story condo, 3 bd., 2.5 ba., prestigious community, beaut. inter., bright ktch., prof. landscape, ctrl. air & heat, close to shop., cozy l/r with f/p, end unit, frml d/r, hdwd. flrs., immac. cond., close to schls. \$1,750. 626/396-9024. PASADENA, townhouse-style apt., near PCC, 2 bd., den, 2.5 ba., 2 fireplaces, a/c, built-in range/oven, refrig., drapes, disposal, laundry, water, gardener, trash pd., \$1,100. 790-7062. PASADENA, studio condo, fully furnished, 1115 E. Cordova Ave., gated facility, 2 blocks from Caltech; pool & BBQ, patio, carport, laundry; utilities paid except electric: non-smoker, no pets; \$875. 626/792-9053, Ray or Marilyn. PASADENA townhome-style apt., furn., 2 bd., 1.5 ba., a/c, parking, patio, laundry facilities, no pets, \$1,195 + utilities. 626/351-9641. PASADENA, spacious 1 bd. guesthouse, quiet Chapman Woods area, stove, refrigerator, w/d, utilities, \$850 + \$500 cleaning deposit. 626/793-7937. PASADENA, furnished 2 bd., 1.5 ba., apt. to share w/Caltech Post Doc, a/c, parking, patio, laundry facilities, no pets, \$595 incl. utilities. 626/351-9641.

Real Estate

LA CANADA, 4 bd., 2.75 bath, 2,410 sq. ft., 100 x 148 lot; pool, priv. backyard, completely re- modeled, new ktch. w/Corian counters/sinks, high gloss white cabinets, breakfast area, indoor laundry, high ceilings in living areas, new windows/doors/floors, 3 bd. w/own closets; master bedroom w/walk-in closet, very bright; \$799K. 790-4553, after 6 p.m. weekdays, or 687-9812. SHOW LOW, Ariz., 3 bd. house, .43 acres w/ ponderosa pines, nat'l gas, sewer, in-town subdivision, close to skiing and fishing, great in- vestment property, house needs help, \$30K/obo. Randall.Mielke@fijivillage.com. WILLIAMS, Ariz. area, (10 mi. away), 43 acres w/2-rm. house on top of cliff w/great views, sea- sonal pond, wildlife everywhere, 4-mi. dirt road access year round, great investment, \$42K cash/obo. Randall.Mielke@fijivillage.com. SILVERLAKES, Calif., vacation club member- ship, 2-bd. condo, 4 wks in resort community, 2 lakes, many amenities, free golf at priv. PGA- rated course w/driving range & putting greens, less than 2 hrs. fr. Pasadena, exchange rights with 3,000+ affiliate domestic/int'l resorts, illness forces sale, \$17,500. 805/967-7725.

Vacation Rentals

ANYWHERE, timeshare week, 1 bd., location based on availability, expires 8/30/02, \$400. 362-3358. BIG BEAR LAKEFRONT, luxury townhome, 2 decks, tennis, pool/spa, beautiful master bd. suite, sleeps 6. 949/786-6548. CAMBRIA, ocean front house, sleeps up to 4, exc. view. 661-28853. HAWAII, Maui condo, NW coast, ocean front view, 25 ft. fr. surf, 1 bd w/loft, compl. frn. phone, color TV, VCR, microwave, d/w, pool, priv. lanai, slps 4, laundry fac., 4/15-12/14 \$105/nite/2, 12/15-4-14 \$120/nite/2, \$15/nite/ add'l person. 949/348-8047, jackandrandy@cox.net. MAMMOTH, Courchevel, fully equipped unit, 2 bd., 2 ba., sleeps 6, short walk to Canyon Lodge and ski lifts. 661/255-7958. MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, sleeps 6-8, fully equipped kitchen incl. micro- wave, D/W, cable TV, VCR, phone, balcony w/view to mtns., Jacuzzi, sauna, streams, fishponds, close to Mammoth Creek, JPL discount. 626/798-9222 or 626/794-0455. OCEANSIDE condo, fully furn., 2 bd., 2 ba., fire- place, full ktch., quiet, relaxing, beautiful beachside setting, BBQ, pool, spa, game room, great ocean view, easy walk to pier and restau- rants, sleeps 8, avail. weekly/monthly. 909/981-7492 or dfhaug@yahoo.com, Darlene. OCEANSIDE, on the sand, charming 1 bd. condo, panoramic view, walk to pier & harbor, pool/spa, game rm., sleeps 4. 949/786-6548. PARIS: Duplex apt. in elegant new building in central area of town, available by the month; el- egantly furnished, beautifully equipped, gourmet kitchen, sleeps 2; walking distance to everything, yet completely quiet; \$2,700. 626/792-5942. ROSARITO BEACH condo, 2 bd., 2 ba., ocean view, pool, tennis, short walk to beach on priv. rd., 18-hole golf course 6 mi. away, priv. secure parking. 626/794-3906. SAN FRANCISCO, Nob Hill honeymoon suite; slps 2 max., full ktch., maid, concierge; re-serve early; \$125/nite; \$750/wk. 626/254-1550.